### (12) INTERNATIONAL APPLICATION PUBLISHED UNDER THE PATENT COOPERATION TREATY (PCT)

# (19) World Intellectual Property Organization

International Bureau



### 

(43) International Publication Date 23 September 2004 (23.09.2004)

**PCT** 

## (10) International Publication Number WO 2004/081336 A1

(51) International Patent Classification7:

E21B 10/56

(21) International Application Number:

PCT/IB2004/000706

(22) International Filing Date: 12 March 2004 (12.03.2004)

(25) Filing Language:

English

(26) Publication Language:

English

(30) Priority Data:

2003/2083

14 March 2003 (14.03.2003) ZA

(71) Applicant (for all designated States except US): ELE-MENT SIX (PTY) LTD [ZA/ZA]; Debid Road Nuffield, 1559 Springs (ZA).

(72) Inventors; and

- (75) Inventors/Applicants (for US only): ROBERTS, Bronwyn, Annette [ZA/ZA]; 94 18th Street, 2193 Parkhurst (ZA). DAVIES, Geoffrey, John [ZA/ZA]; 36 Boundary Road, Linden Extension 3, 2194 Randburg (ZA). ACHILLES, Roy, Derrick [ZA/ZA]; 608 San Martinho Leicester Road, 2007 Bedfordview (ZA).
- (74) Agents: DONALD, Heather, June et al.; Spoor & Fisher, P.O. Box 41312, 2024 Craighall (ZA).

(81) Designated States (unless otherwise indicated, for every kind of national protection available): AE, AG, AL, AM, AT, AU, AZ, BA, BB, BG, BR, BW, BY, BZ, CA, CH, CN, CO, CR, CU, CZ, DE, DK, DM, DZ, EC, EE, EG, ES, FI, GB, GD, GE, GH, GM, HR, HU, ID, IL, IN, IS, JP, KE, KG, KP, KR, KZ, LC, LK, LR, LS, LT, LU, LV, MA, MD, MG, MK, MN, MW, MX, MZ, NA, NI, NO, NZ, OM, PG, PH, PL, PT, RO, RU, SC, SD, SE, SG, SK, SL, SY, TJ, TM, TN, TR, TT, TZ, UA, UG, US, UZ, VC, VN, YU, ZA, ZM, ZW.

(84) Designated States (unless otherwise indicated, for every kind of regional protection available): ARIPO (BW, GH, GM, KE, LS, MW, MZ, SD, SL, SZ, TZ, UG, ZM, ZW), Eurasian (AM, AZ, BY, KG, KZ, MD, RU, TJ, TM), European (AT, BE, BG, CH, CY, CZ, DE, DK, EE, ES, FI, FR, GB, GR, HU, IE, IT, LU, MC, NL, PL, PT, RO, SE, SI, SK, TR), OAPI (BF, BJ, CF, CG, CI, CM, GA, GN, GQ, GW, ML, MR, NE, SN, TD, TG).

#### Published:

- with international search report
- before the expiration of the time limit for amending the claims and to be republished in the event of receipt of amendments

For two-letter codes and other abbreviations, refer to the "Guidance Notes on Codes and Abbreviations" appearing at the beginning of each regular issue of the PCT Gazette.

(54) Title: TOOL INSERT

(57) Abstract: A tool insert comprises a working layer of ultra-hard abrasive, particularly PCD, bonded to a substrate along an interface. The working layer presents a working surface and a periphery around the working surface which provides a cutting edge for the insert. The working layer of ultra-hard abrasive has a first region extending into the layer from the working surface, and a second region in contact with the first region, the wear resistance of the first region being less than that of the second region. The wear resistance of the first region is between 50% and 95% of that of the second region, preferably between 60% and 90%, most preferably between 70% and 89%.

